



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

V

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/686,333 | 10/14/2003 | Jerome M. Eldridge | MI22-2395 | 7203 |
| 21567 | 7590 | 09/10/2004 | EXAMINER | |
| WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201 | | | DUONG, KHANH B | |
| | | ART UNIT | PAPER NUMBER | |
| | | | 2822 | |

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/686,333 | ELDRIDGE, JEROME M. |
| | Examiner | Art Unit |
| | Khanh Duong | 2822 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 14 October 2003.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 56-83 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 56-83 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 14 October 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/14/2003.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION

Response to Preliminary Amendment

This Office Action is in response to the Preliminary Amendment filed on October 14, 2003.

Accordingly, claims 1-55 were canceled, and new claims 56-83 were added.

Currently, claims 56-83 are pending in the application.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on October 14, 2003 is being considered by the examiner.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “**middle dielectric layer between the inner and outer dielectric layers**”, as recited in Claims 58 and 77, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 56, 57, 61, 73 and 79 are rejected under 35 U.S.C. 102(b) as being anticipated by Kammerdiner et al. (U.S. 5,142,437).

Re claims 56, 57, 61, 73, and 79, as shown in FIG. 1, Kammerdiner et al. (“Kammerdiner”) discloses a capacitor construction (see cols. 2-5) comprising: an inner dielectric layer 20(a) over an inner electrode 10(a), the inner dielectric layer 20(a) comprising an oxidized alloy (ITO) of at least two metals (indium, tin) or “some of the conducting perovskites”; an outer dielectric layer (passivation layer) 30 on the inner dielectric layer 20(a), the outer dielectric layer 30 comprising an oxide (PZT) of a material (lead, zirconium, titanium), wherein the outer dielectric layer 30 is on and in contact with the inner dielectric layer 20(a); and an outer electrode 10(b) over the outer dielectric layer 30.

Re further claims 56, 61 and 73, the functional recitations that “such selected material being generally passivated against carbon and nitrogen reaction”, “the at least two of the metals exhibit a substantial difference in chemical affinity for oxygen” and “the passivation layer exhibiting passivation against carbon and nitrogen reaction with the inner dielectric layer” have not been given patentable weight because they are narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a “means” for performing the specified function, as set forth 35 U.S.C. 112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 59, 60, 65-69, 74, 78 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kammerdiner.

Kammerdiner et al. ("Kammerdiner") discloses a capacitor construction (an integrated circuit) previously as described, which construction is repeated herein.

Re claims 59, 65-68 and 78, Kammerdiner discloses the outer dielectric layer 30 comprising an oxide (PZT) of a material (lead, zirconium, titanium) *instead* of amorphous silicon, aluminum or alloys thereof (Al_2O_3 , SiO_2 , etc.).

However, according to Applicant's disclosure at paragraph [0043] on page 18, the passivation layer 18 can comprise Ga, In, Ti, Ge, Sn, Pb, Sb, Bi and Po in addition to Al and Si.

Thus, even though Kammerdiner fails to disclose Al, Si or alloys thereof, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select such material for the passivation layer as evidenced by Applicant's disclosure.

Re claims 60, 69 and 80, Kammerdiner discloses the outer dielectric layer 30 comprising a thickness of 500 to 10,000 angstroms *instead* of from about 0.5 to about 2 nanometers (5 to 20 angstroms) [see col. 3, ln. 35-37].

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Kammerdiner by selecting a thickness within the ranges as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Re claim 74, Kammerdiner fails to disclose the component being comprised of a dynamic random access memory (DRAM) or a non-volatile field effect transistor memory.

However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Claims 58, 62-64, 70-72, 77 and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kammerdiner in view of Miyashita et al. (EP 0727832 A1).

Re claims 58, 62-64, 70-72, 77 and 81-83, Kammerdiner fails to disclose the inner dielectric layer being comprised of multiple sublayers (e.g. inner and middle dielectric layers) of an oxidized alloy ($PbTiO_3$ or $PbZr_yTi_{1-y}O_3$) of at least two metals in a perovskite-type crystalline structure.

Miyashita et al. (“Miyashita”) suggests in FIG. 2 a capacitor dielectric layer 15 being comprised of multiple sublayers 13 of an oxidized alloy ($Pb(Zr_xTi_{1-x})O_3$, etc.) of at least two metals in a perovskite-type crystalline structure [see also page 3, line 32 to page 4, line 15]. Thus, Miyashita has ultimately suggested that a single dielectric layer is equivalent to a single dielectric layer comprising such multiple sublayers.

Since Kammerdiner and Miyashita are both from the same field of endeavor, the purpose disclosed by Miyashita would have been recognized in the pertinent prior art of Kammerdiner.

Therefore, because such structures were art-recognized equivalents as demonstrated by Miyashita at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute one structure for the other.

Furthermore, it would have been obvious to utilize the oxidized alloy of Miyashita in the structure of Kammerdiner, since Miyashita states on page 1, paragraph "(57)" that such a piezoelectric thin film has good properties, for example, high dielectric constant and a high piezoelectric strain constant.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 56-83 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim1-21 of U.S. Patent No. 6,639,267.

Although the conflicting claims are not identical, they are not patentably distinct from each other because it must be inherent that all the dielectric layers are formed on a semiconductor substrate.

Conclusion

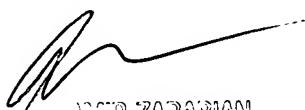
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Thursday (9:00 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KBD



AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800